

Remarks:

These remarks are responsive to the Office action dated April 17, 2007. Prior to entry of this response, claims 1-26 were pending in the application. By way of this response, claims 1 and 9 are amended and claim 10 is cancelled. Applicants respectfully request reconsideration of the application and allowance of the pending claims.

Allowable Subject Matter

Claims 10, 12, 14, and 25-26 are indicated to be allowable if rewritten in independent form.

Applicants thank the Examiner for the indication of allowable subject matter. Applicants have amended claim 9 to include the features of original claim 10. Accordingly, Applicants respectfully submit that claim 9 is in a condition for allowance. Claims 11-14 depend directly or indirectly from claim 9. Therefore, Applicants believe that these are allowable for at least the same reasons.

Rejections under 35 U.S.C. § 102

Claims 1-9, 11, 13, and 15-24 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent Number 3,884,207 (Kuehn III).

Claim 1

In order to further prosecution of this application, Applicants have amended independent claim 1 to include features of original claim 10 which the Examiner has indicated to be allowable subject. Specifically, claim 1 has been amended to include, among other features, "a charge balance is maintained on said first and second energy storage devices." As indicated in the Allowable Subject Matter of the Office action, Keuhn does not disclose an electronic circuit where a charge balance is maintained between first and second energy storage devices.

Accordingly, Keuhn does not disclose each and every element of amended claim 1. Therefore, Applicants respectfully request the rejection under 35 U.S.C. 102(b) be withdrawn for at least the reasons described above. Claims 2-8 depend directly or indirectly from claim 1. Thus, Applicants respectfully request the rejection of these claims be withdrawn for at least the same reasons.

Furthermore, claim 1 includes the feature, "a first electromechanical actuator coil coupled to a cylinder valve of an internal combustion engine." Applicants have reviewed the cited reference and could find no disclosure by Keuhn of a first electromechanical actuator coil coupled to a cylinder valve of an internal combustion engine. Rather, Keuhn discloses that a single magneto generator coil is provided for each cylinder for the purpose of ignition in the cylinder.

In contrast to Keuhn, Applicants disclose a circuit that includes an electromechanical coil coupled to a valve of the cylinder which may be used to drive actuation of the cylinder valve. Further, Keuhn discloses that the magneto generator coil is positioned in close proximity to a flywheel secured to the drive shaft of the internal combustion engine which is conventional. In a conventional internal combustion engine the drive shaft may be located away from the top of the cylinder where the valves of the cylinder may be located. Thus, the coil as disclosed by Keuhn may be positioned away from the valve and not coupled to the cylinder valve as required by Applicants' claim 1.

Accordingly, Applicants respectfully request that the rejection of independent claim 1 under 35 U.S.C. 102(b) be withdrawn for at least these additional reasons.

Claim 15

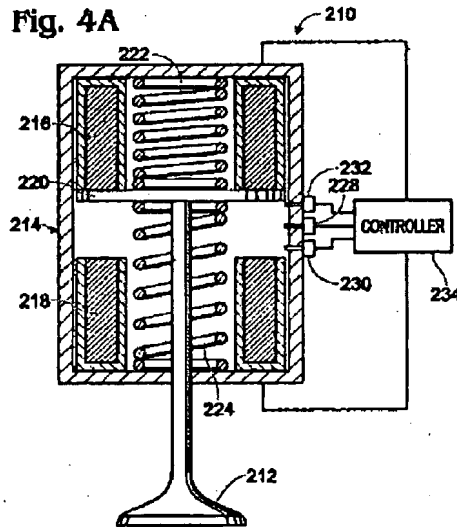
Independent claim 15 recites, among other features, "a single or multiple coil actuator of a cylinder valve, the cylinder valve in an internal combustion engine." As shown in Applicant's Fig. 5 (reproduced below), an exemplary electromagnetic valve actuator 214 may include coils 216 and 218 which may drive armature 220 to control movement of the cylinder valve 212.

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Reply to Office Action of April 17, 2007



The Office action cites col. 2, lines 43-46 and lines 55-57 of Keuhn as teaching the claimed feature. Specifically, Keuhn states:

Referring now to the block diagram of FIG. 1, there is shown a conventional ignition system for a two-cylinder, two-cycle internal combustion engine incorporating the present invention. Specifically, there is shown enclosed by the dashed line box 10, the solid-state energy storage and discharge circuit which has been devised to improve the performance characteristics of such an ignition system.

The overall system includes a flywheel 12 which is secured to the drive shaft 14 and which is provided with a permanent magnet 16 integrally mounted therein, as is conventional. In close proximity to the periphery of the flywheel 12 there is positioned a pair of magneto-generator coils 18 and 20, with one such coil being provided for each cylinder in the engine. When the perma-

However, Applicants could find no mention of a single or multiple coil actuator of a cylinder valve in the citation or anywhere else in Keuhn. Rather, Keuhn discloses a circuit which has been devised to improve the performance characteristics of an *ignition* system that is not related to cylinder valves.

Accordingly, Keuhn does not disclose each and every element of independent claim 15. Therefore, Applicants respectfully request that the

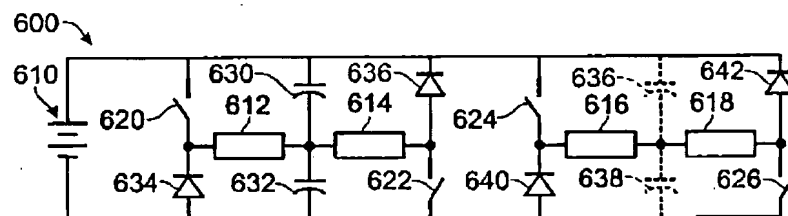
rejection under 35 U.S.C. 102(b) be withdrawn for at least the reasons described above. Claims 16-19 depend directly or indirectly from claim 15. Thus, Applicants respectfully request the rejection of these claims be withdrawn for at least the same reasons.

Claim 20

Independent claim 20 includes, among other features, "a first coil coupled to a cylinder valve actuator of an engine, said first coil having a first end and a second end." As discussed above, Applicants have reviewed the cited reference and could find no disclosure by Keuhn of a first electromechanical actuator coil coupled to a cylinder valve of an internal combustion engine. Rather, Keuhn discloses that a single magneto generator coil is provided for each cylinder for the purpose of ignition in the cylinder. In contrast to Keuhn, Applicants disclose a circuit that includes an electromechanical coil coupled to a valve of the cylinder which may be used to drive actuation of the cylinder valve. For at least this reason, Applicants respectfully request that the rejection of independent claim 20 under 35 U.S.C. 102(b) be withdrawn.

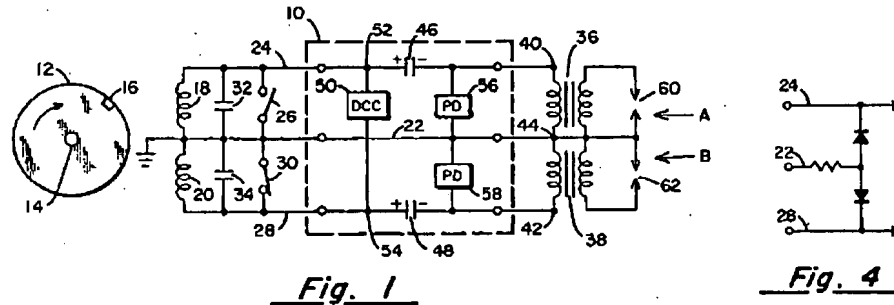
Furthermore, claim 20 recites, "a first diode coupled between said first end of said first coil and said negative terminal." and "a second diode coupled between said second end of said second coil and said positive terminal." One example embodiment of such a configuration is shown in Fig. 6 (reproduced below) in which a second diode (636) is coupled between the second end of said second coil (614) and the positive terminal.

Fig. 6



Applicants Fig. 6

The Office action cites Fig. 4 of Keuhn (reproduced below) as teaching the claimed features.



Keuhn Figs.1 and 4

However, Applicants have reviewed Fig. 4 of Keuhn as well as the corresponding written description and Keuhn does not explicitly disclose how the diode circuit shown in Fig. 4 may be connected to the circuit shown in Fig. 1. Furthermore, even if it is assumed that the diode circuit of Fig. 4 is connected in parallel to coils 18 and 20 of Fig. 1, the configuration of the diodes does not satisfy the configuration as claimed in independent claim 20. In particular, Keuhn discloses in Fig. 1 that the second end of the second coil (20) is connected to the positive terminal (28). Thus, in order to satisfy the claimed configuration both ends of the second diode would have to be coupled to the positive terminal. However, as shown in Fig. 4, the second or lower diode is connected between the positive terminal (28) and the negative terminal (22).

Accordingly, Keuhn does not teach each and every element as claimed in independent claim 20. Therefore, Applicants respectfully request that the rejection of independent claim 20 under 35 U.S.C. 102(b) be withdrawn for at least these additional reasons. Claims 21-26 depend directly or indirectly from claim 20. Thus, Applicants respectfully request the rejection of these claims be withdrawn for at least the same reasons.

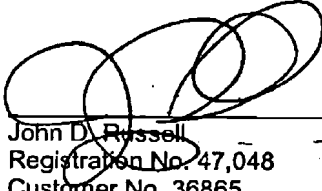
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Applicants believe that this application is now in condition for allowance, in view of the above amendments and remarks. Accordingly, Applicants respectfully request that the Examiner issue a Notice of Allowability covering the pending claims. If the Examiner has any questions, or if a telephone interview would in any way advance prosecution of the application, please contact the undersigned attorney of record.

Please charge any cost incurred in the filing of this Response, along with any other costs, to Deposit Account No. 06-1510.

Respectfully submitted,

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